Session 16 Assignment 1 Question

Problem Statement 1:

A test is conducted which is consisting of 20 MCQs (multiple choices questions) with every MCQ having its four options out of which only one is correct. Determine the probability that a person undertaking that test has answered exactly 5 questions wrong.

Solution:

n = 20, n - k = 5, k = 20 - 5 = 15

The probability of success = probability of giving a right answer = s = $\frac{1}{4}$

Hence, the probability of failure = probability of giving a wrong answer = 1 - s
= 1 - $\frac{1}{4}$ = $\frac{3}{4}$

When we substitute these values in the formula for Binomial distribution we get,

So, P (exactly 5 out of 20 answers incorrect) = C (20, 5) * $(\frac{1}{4})^{15}$ * $(\frac{3}{4})^{5}$

P (5 out of 20) = $\frac{(20*19*18*17*16)}{(5*4*3*2*1)}$ *$(\frac{1}{4})^{15}$ * $(\frac{3}{4})^{5}$

= 0.0000034 (approximately)

Thus the required probability is 0.0000034 approximately.

Problem Statement 2:

A die marked A to E is rolled 50 times. Find the probability of getting a "D" exactly 5

times.

Solution:

n = 50, k = 5, n - k = 4/5.

The probability of success = probability of getting a “D”= s = 1/5

Hence, the probability of failure = probability of not getting a “D” = 1 - s = 4/5.

Problem Statement 3:

Two balls are drawn at random in succession without replacement from an urn containing 4 red balls and 6 black balls.

Find the probabilities of all the possible outcomes.

Solution:

Total Outcomes= 6+4 = 10

probability of getting red ball= 4/10=2/5

probability of getting black ball = 6/10 = 3/5